



DEPARTMENT OF COMMERCE

National Institute of Standards and Technology

CHIPS Manufacturing USA Institute

AGENCY: National Institute of Standards and Technology, Department of Commerce.

ACTION: Notice of Intent (NOI).

SUMMARY: The CHIPS Research and Development Office (CHIPS R&D) intends to announce an open competition for a new Manufacturing USA Institute. The expected competition will seek to establish one (1) Manufacturing USA Institute focused on the topic of digital twins for semiconductor manufacturing, packaging, and assembly and the validation of such digital twins in a physical prototyping facility. This NOI is provided to allow potential applicants sufficient time to develop meaningful collaborations among industry, academic, Federal laboratory, and state/local government partners.

FOR FURTHER INFORMATION CONTACT: All inquiries may be directed to Mahesh Mani (301-975-2000) via email to research@chips.gov, with a subject line stating: 'MFG USA CHIPS Institute Competition.' All answers, which will be provided at the sole discretion of CHIPS R&D, will be posted on the NIST competition website at <https://www.nist.gov/chips/chips-RD-funding-opportunities>.

SUPPLEMENTARY INFORMATION:

Purpose. The CHIPS Research and Development Office (CHIPS R&D) intends to announce an open competition for a new Manufacturing USA Institute, pursuant to 15 U.S.C. 4656(f). The expected competition will seek to establish one (1) Manufacturing USA Institute focused on the topic of digital twins for semiconductor manufacturing, packaging, and assembly and the validation of such digital twins in a physical prototyping facility. This CHIPS Manufacturing USA Institute will be established and

operate in accordance with 15 U.S.C. 278s, as amended. For general planning purposes, the minimum expected NIST commitment will be approximately \$200 million over a 5-year period. CHIPS R&D expects to leverage private sector and other non-Federal investments on a substantially greater than 1:1 basis.

This NOI is provided to allow potential applicants sufficient time to develop meaningful collaborations among industry, academic, Federal laboratory, and state/local government partners. Details in this NOI should also inform discussions at a planned February 2024 CHIPS Manufacturing USA Institute Industry Day where the government will solicit feedback on the NIST plans and timelines for the Institute. CHIPS R&D expects to announce the competition via a Notice of Funding Opportunity (NOFO) on Grants.gov at <https://www.grants.gov> in the second quarter of calendar year 2024. CHIPS R&D reserves the right to refine program structure, cost, co-investment requirements, and other program details in the eventual NOFO. In the event of inconsistencies between the NOI and the NOFO, the NOFO shall take precedence.

Background.

Program Background: The CHIPS and Science Act appropriated approximately \$50 billion to the Department of Commerce – \$39 billion in incentives to onshore semiconductor manufacturing and \$11 billion to advance U.S. leadership in semiconductor R&D. Congress authorized NIST to establish not more than three Manufacturing USA Institutes focused on semiconductor manufacturing. Manufacturing USA Institutes are public-private partnerships that bring together industry of all sizes, universities and community colleges, federal agencies, and state organizations to accelerate innovation by investing in industrially relevant technologies that advance specific technology sectors. Institutes may address the full spectrum of advanced manufacturing challenges, such as innovation for manufacturing processes, novel

materials, cross cutting enabling technology, supply chain integration methodology and education and workforce development.

After receiving extensive public input, CHIPS R&D determined that a single institute with both regionally-focused programs and meaningful cross-region participation will best meet the CHIPS R&D program goals of strengthening U.S. technology leadership, accelerating ideas to market, and realizing a robust semiconductor workforce. Despite substantial existing investment in proprietary digital twin technology, the United States lacks a comprehensive environment for collaborative development and validation of semiconductor industry digital twins. In establishing a single institute with national reach, CHIPS R&D seeks to enable the seamless integration of digital twin models into U.S. semiconductor manufacturing, advanced packaging, and assembly, enabling rapid adoption of innovations and enhancing domestic competitiveness for decades. The CHIPS Manufacturing USA Institute will foster a collaborative environment to significantly expand innovation, bring tangible benefits to manufacturers of all sizes, strengthen diverse research institutions, and ensure a national reach in workforce development.

CHIPS Manufacturing USA Institute Objectives: CHIPS R&D expects that the NOFO soliciting proposals will seek to achieve the following objectives:

1. Significantly reduce U.S. chip development and manufacturing costs, such as by improving capacity planning, optimizing production, and enabling real-time process adjustments.
2. Improve development cycle time and accelerate adoption of innovative semiconductor manufacturing technologies, including breakthrough tools, manufacturing equipment, materials, and manufacturing processes validated at the shared facility.

3. Advance digital twin-enabled curricula and best practices for training the semiconductor workforce nationwide.
4. Create a digital twin marketplace for industry, including entrepreneurs, to access digital models and manufacturing process flows and to de-risk digital twin development and implementation.

CHIPS R&D expects to solicit proposals demonstrating strong industry leadership capable of catalyzing collaboration in software development relevant to digital twins (including but not limited to electronic design automation tools), semiconductor manufacturing, advanced packaging, and assembly. Expected activities include establishing a shared physical facility where companies can experiment while protecting proprietary information; enabling industry-relevant research projects; leveraging a shared marketplace that enables data aggregation across companies, while protecting proprietary data, to make powerful digital twins available at low cost; and operating an education and workforce development program, which may include partnerships with educational institutions.

Competition Information: Once the open competition has been announced, further information may be found at <https://www.nist.gov/chips/chips-RD-funding-opportunities>.

System for Award Management: In anticipation of the NOFO, CHIPS R&D encourages potential applicants to complete the following steps, which are required to submit applications for Federal assistance:

- Register with the System for Award Management (SAM) at <https://www.sam.gov>.

CHIPS R&D strongly encourages applicants to register for SAM.gov as early as possible. While this process ordinarily takes between three days and two weeks, in some circumstances it can take six or more months to complete due to

information verification requirements. Recipients will be required to maintain an active registration in SAM and re-validate registration annually.

- Register for a Grants.gov (<https://www.grants.gov/>) account. It is advisable also to go to “manage subscriptions” on Grants.gov and sign up to receive automatic updates when amendments to a funding opportunity are posted.

Disclaimer. This NOI does not constitute a solicitation. No applications may be submitted in response to this NOI. Any inconsistency between information within this NOI and the eventual NOFO announcing the CHIPS Manufacturing USA Institute award competition shall be resolved in favor of the NOFO.

Authority: DOC CHIPS activities were authorized by Title XCIX—Creating Helpful Incentives to Produce Semiconductors for America of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 (Pub. L. 116-283, often referred to as the CHIPS Act).

Tamiko Ford,

NIST Executive Secretariat.

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